Albuquerque Bernalillo County
Water Utility Authority

P.O. Box 1293
Albuquerque, NM 87103

Water Quality Laboratory

QUALITY ASSURANCE MANUAL

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History of Revision This table lists the revision history and effective dates of this manual.

Revision	Date	Description of Changes
1.0.0 1.2.0 1.2.2 1.2.3	December 1988 March 1989 July 1992 September 1993	Original Document Revised to meet needs of A2LA and placed on Makintosh Revised to meet needs of A2LA/Dr. Langley Revised after visit by Mitzi Miller/A2LA
2.0.1 2.1.1 2.1.2 2.1.3 2.1.4 2.2.0	August 1994 October 1995 February 1996 January 2007 January 1998 May 1998	Major revision and placed in Amipro Word Processor Minor revision to satisfy A2LA requirements after assessment Further minor editing to satisfy A2LA requirements Editing to improve readability drop porting in SOP's Review and update to meet policy and procedures Moved document for WordPro to Word Perfect 6.2
03	June 1, 2006	New QA Manager-Completely rewrote QAM to reflect ISO17025
04	August 8, 2006	Revised to meet A2LA audit requirements
05	April 15, 2008	Revised to meet new A2LA checklist prior to audit
06	December 24, 2008	Revised to address A2LA on-site assessment findings
07	February 8, 2009	Section 4.1.9 revised in response to A2LA assessor comments during January 2009 re-assessment

Scope of Accreditation

Parameter		Potable Water A2LA Accredited	Nonpotable Water A2LA Accredited
Aluminum	AL	SM 3120 B	SM 3120 B
Antimony	SB	SM 3113 B	SM 3113 B
Arsenic	AS	SM 3113 B	SM 3113 B
Barium	BA	SM 3120 B	SM 3120 B
Beryllium	BE	SM 3120 B	SM 3120 B
Boron	B	SM 3120 B	SM 3120 B
Cadmium	CD	SM 3113 B/ 3111 B	SM 3113 B/ 3111 B
Calcium	CA	SM 3120 B	SM 3120 B
Chromium	CR	SM 3113 B/ 3111 B	SM 3113 B/ 3111 B
Cobalt	CO	SM 3120 B	SM 3120 B
Copper	CU	SM 3120 B/ 3111 B	SM 3120 B/ 3111 B
Iron	FE	SM 3120 B	SM 3120 B
Lead	PB	SM 3113 B/ 3111 B	SM 3113 B/ 3111 B
Magnesium	MG	SM 3120 B	SM 3120 B
Magnganese	MN	SM 3120 B	SM 3120 B
Mercury	HG	SM 3112 B	SM 3120 B
Molybdenum	MO	SM 3120 B	SM 3120 B
Nickel	NI	SM 3120 B/ 3111 B	SM 3120 B/ 3111 B
Potassium	K	SM 3120 B	SM 3120 B
Selenium	SE	SM 3113 B	SM 3113 B
Silicon	Si-SI02	SM 3120 B	SM 3120 B
Silver	AG	SM 3113 B/ 3111 B	SM 3113 B/ 3111 B
Sodium	NA	SM 3120 B	SM 3120 B
Thallium	TL	SM 3113 B	SM 3113B
Vanadium	V	SM 3120 B	SM 3120 B
Zinc	ZN	SM 3120 B/ 3111 B	SM 3120 B/ 3111 B
Ammonia (as N)	AMON		EPA 350.1
Kjeldahl nitrogen	TKN		SM 4500 NH3ORGB
Nitrate (as N)	N03	SM 4110 B	SM 4110 B
Nitrate-nitrate (as N)			SM 4500 NO3F
Nitrite (as N)	N02	SM 4110 B	SM 4500 NO2F
Orthophosphate (as P)	ORP04	SM 4110 B	SM 4100 B
Biochemical Oxygen	BOD		SM 5210
Carbonaceous BOD	CBOD		SM 5210
Chemical Oxygen Demand	COD		SM 5220
Alkalinity	ALKN	SM 2320 B	SM 2320 B
Chloride	CL	SM 4110 B	SM 4110 B
Chlorine residual			SM 4500 Cl D,G
Fluoride	F	SM 4500 F, C	SM 4500 F,C
Hardness	HARD	SM 2340 C	SM 2340 C
Dissolved oxygen	DO		SM 4500 D, C, G
Phenols			SM 510
Total Solids	TS		SM 2540 G
Total Dissolved Solids	TDS	SM 2540 C	SM 2540 C
Total Suspended Solids	TSS		SM 2540 D
PH		SM 4500 H+, B	SM 4500 H+, B
Conductivity	SPCOND	SM 2510 B	SM 2510 B
Sulfate	SO4	SM 4110 B	SM 4110 B
Temperature		SM 2550 B	SM 2550 B
Turbidity	TUR	SM 2130 B	SM 2130 B
Fecal coliform	FS		SM 9222 D
Total coliform	TC	SM 9222 B/ SM 9223 B	SM 9223 B

1.0 Scope

1.1 To ensure the validity of the analytical data, an established, routine, and rigid quality assurance program is continually necessary to monitor the reliability (precision and accuracy) of the results reported and to control the quality so that it meets the program requirements for reliability.

1.2 The Water Quality Laboratory (WQL) recognizes its responsibility as provider of quality services. Consequently, WQL has developed and documented a quality management system to better satisfy the needs of its clients and to improve management of the laboratory. The quality system complies with the International Standard ISO/IEC 17025, 2005.

1.3 In order to accomplish its mission, the laboratory must be certified under the auspices of the New Mexico Environment Department Drinking Water Bureau. In order to accomplish state certification, the Water Quality Laboratory maintains accreditation through the American Association for Laboratory Accreditation (A2LA).

1.4 WQL Quality Assurance Manual defines the quality system, establishes responsibilities of the personnel affected by the system, and provides general procedures for all activities comprising the quality system. In addition, this manual is utilized for the purpose of informing clients of the quality system, and what specific controls are implemented to assure service quality. This manual describes the standard operating procedures and quality assurance/quality control program utilized by Water Quality Laboratory to provide assurance that the quality control duties are being performed effectively.

2.0 References

The following documents are the primary references used to support aspects of testing and quality activity by the Water Quality laboratory:

2.1 ISO/IEC (International Standards Organization/International Engineering Council) International Standard 17025 "General requirements for the competence of testing and calibration laboratories" (1999).

2.2 American Association for Laboratory Accreditation "General Requirements for Accreditation", (August 2000) and "Environmental Program Requirements" supplement (June 2001).

2.3 Methods for Chemical Analysis of Water and Wastes, EPA/600/4-79-020, 1983.

2.4 Standard Methods for the Examination of Water and Wastewater (Most recent addition approved by 40CFR 136 Table 1-B), Andrew Eaton, et al., AWWA/WEF *(American Water Works Association/Water Environment Federation*, 1995.)

2.5 Manual for Microbiological Certification of Drinking Water Laboratories *(New Mexico Scientific Laboratory Division*, July 2001.)

3.0 Terms and Definitions

3.1 QA SOP-007 identifies all *Terms and Definitions* applied at Water Quality Laboratory.

4.0 Management Requirements

4.1 Organization

4.1.1 Laboratory Legal Responsibility

The Water Quality Laboratory is owned and operated by the Albuquerque Bernalillo County Water Utility Authority. The Water Utility Authority is a joint agency of the City of Albuquerque and the County of Bernalillo that administers the water and wastewater utility for all of Albuquerque and Bernalillo County. New Mexico Senate Bill 887 (Laws 2003, Chapter 437, codified as NMSA 1978, Section 72-1-10) created the Authority on June 21, 2003. Therefore, the Water Utility Authority holds legal responsibility for its operation and is organized to operate in accordance with the requirements of ISO/IEC 17025.

4.1.2 Laboratory Requirements

Albuquerque Bernalillo County Water Utility Authority Water Quality Laboratory maintains accreditation through American Association of Laboratory Accreditation (A2LA), complying with ISO/IEC (International Organization for Standardization) 17025-2005. Additionally, as a laboratory that is required to analyze samples for federal, state and municipal regulatory compliance purposes, WQL will satisfy the needs of clients by meeting the requirements of ISO/IEC 17025.

WQL is divided into two sections, the QA Group and the Technical Group. The QA section consists of one manager, one supervisory and three administrative assistants. The Technical side consists of one manager, two supervisors and eleven lab analysts. The Technical Program Manager oversees both sections.

4.1.3 Facility

This Quality Assurance Manual (QAM) will cover work carried out at WQL's permanent facility at 4201 Second Street SW.

4.1.4 Water Authority Department Organization Relationship

See Appendix for organization charts of Water Utility Authority, Compliance Division, and Water Quality Laboratory.

Under New Mexico state law (NMSA 1978, Section 72-1-10), the Authority has the power to "set policy and regulate, supervise and administer the water and wastewater utility of Albuquerque and Bernalillo County, including the determination and imposition of rates for services." The Authority adopted several of the City of Albuquerque's policies and procedures for the operation of the water and wastewater utility through a Memorandum of Understanding. The Authority will continue to be operated under the City's policies and procedures until the Authority has adopted its own policies and procedures.

The Authority is comprised of a board of elected officials, which include three City Councilors, three County Commissioners and the Mayor of the City. The Executive Director is appointed by the Authority Board and oversees the Authority. The Operations Manager is hired through the Authority employment policies and oversees the operations of the Operating Division and receives general administrative direction from the Executive Director. The Compliance Division Manager manages and directs the Authority's Environmental Compliance Division and receives general administrative direction from the Operations Manager. The Technical Program Manager manages and directs the Water Quality Laboratory and receives general administrative direction from the Compliance Division Manager. See Appendix for organization charts of Water Utility Authority, Compliance Division, and Water Quality Laboratory. Job description for people within the parent organization are on file in QA file room.

4.1.5 Authority and Resources

The Albuquerque Bernalillo County Water Utility Authority, through the ABCWUA General Manager and the Compliance Division Manager, gives WQL the authorization and financial resources to carry out its mission. Internal WQL policies authorize management and technical personnel to implement, maintain and improve the management system as needed to identify occurrence of departures from the quality system or technical processes and to initiate actions to resolve such departures.

4.1.6 Minimization of Undue Influence

The Compliance Division ensures WQL personnel are free from any undue internal, financial and other pressures that may adversely affect the quality of work. Additionally, the division abides by the ABCWUA Merit System Ordinance. In accordance with the Merit System Ordinance, the Mayor's Office developed and maintains Personnel Rules and Regulations, which deal with issues including employee code of conduct and rules for hiring, disciplining and dismissing personnel. Managers are periodically required to attend training in use of the Personnel Rules and Regulations. Bargaining unit contracts are administered between the ABCWUA and the local American Federation of State, County and Municipal Employees Union (AFSME), which covers laboratory staff. These contracts take precedence over the Personnel Rules and Regulation, but do not modify employee code of conduct provisions.

4.1.7 Client Confidentiality

Client confidentiality is usually maintained via blind logging of samples with customer identification codes, called Client Sample Point ID, to prevent lab staff from directly knowing any individual sample's identity. In those cases where addresses or sample locations are known, laboratory personnel are encouraged to maintain confidentiality at all cost. In addition, laboratory staff is bound to the ABCWUA Employee Code of Conduct where confidentiality is specifically addressed.

The following security policies are implemented to protect the transmission of all analytical tests and records. The exterior doors to the laboratory wing are locked at all times and only authorized WQL employees are allowed access into the laboratory wing. All visitors, contractors, vendors, sales staff, repair techs and auditors must follow requirements outlined in WQL Chemical Hygiene Plan, Section 5.2.

To protect the integrity of the QA records only authorized QA personnel are allowed access to the QA file room and the archive file room. All records must be checked out with QA Manager or Supervisor.

4.1.8 Laboratory Personnel Confidentiality

WQL personnel must at all times avoid involvement in any activities that would diminish confidence in its competence, impartiality, judgment or operational procedures. For this reason lab analysts are not allowed to directly communicate with clients in reference to laboratory procedures and/or test results. The only exception to this rule is in the area of Microbiology, where clients are allowed to call laboratory supervisors for pass or fail results and these contacts are recorded in a logbook for tracking these client contacts. For all other official results and inquiries, clients must follow Client Inquiry requirements outlined in section 4.8 of this manual.

WQL management implements a Data Integrity Policy as a formal part of new employee orientation and at minimum once annually for all current employees. Employees are required to understand that any infractions of the laboratory quality management procedures will results in a detailed investigation that could lead disciplinary actions or termination of employment. Lab management must support and encourage these procedures by upholding and implementing the requirements of these procedures. Records of topics covered are filed in the personnel files for each employee, which include signatures and date of training. See QA SOP 005, Section 9.0, for Data Integrity Policy implementation procedures.

4.1.9 Laboratory Management Responsibilities and Authorities

- **Technical Program Manager**
  - **Responsibilities**
    - Takes administrative direction from the Compliance Division Manager
    - Exercises day-to-day supervision of overall laboratory operations and manages intra-laboratory coordination
    - Oversees the development and administration of the laboratory budget.
    - Oversees invoicing and accounts receivable activities
    - Monitors standards of performance in quality control and quality assurance.
    - Oversees client relations for the laboratory.
    - Receives and coordinates responses to client inquiries and complaints.
    - Coordinates annual laboratory management reviews.
    - Determines laboratory capacity when considering new work
  - **Authorities**
    - Directs activities of and conducts performance reviews for Laboratory Manager and Quality Assurance Manager
    - Approves expenditures of laboratory funds for staffing, equipment, materials and supplies.
    - Negotiates and manages contracts with suppliers and with clients.
    - Authorizes new testing programs and temporary deviations from established procedures.
    - Authorizes access levels to SQL*LIMS

- Issues stop work orders if any nonconformance jeopardizes analytical results and coordinates necessary actions to correct nonconformance
- Serves as Chemical Hygiene Officer, maintaining Chemical Hygiene Policy and safety training.
- Serves as Deputy Quality Assurance Manager, and assumes QA responsibilities in the absence of the QA Manager.

- **Quality Assurance Manager**
  - **Responsibilities**
    - Takes administrative direction from Technical Program Manager.
    - Serves as the focal point for QA/QC and is responsible for the oversight and/or review of quality control data
    - Obtains documented training and/or experience in QA/QC procedures and maintains knowledge about the quality management system and about analytical test methods.
    - Develops and maintains WQL Quality Assurance Manual
    - Serves as liaison to American Association of Laboratory Accreditation (A2LA)
    - Oversees filing system for personnel records, control documentation, and safety records
    - Manages laboratory performance evaluation (PE) and performance testing (PT) programs in support of the Demonstration of Capability process
    - Manages sample-receiving operations
    - Oversees and coordinates SQL-LIMS operations
    - Serves as Deputy Chemical Hygiene Officer (DCHO).
  - **Authorities**
    - Directs activities of and conducts performance reviews for subordinate Quality Assurance personnel
    - Functions independently from laboratory operations, and has direct access to the Compliance Division Manager to ensure consistent adherence to laboratory quality system
    - Conducts internal audits of laboratory technical operations.
    - Issues stop work orders if any nonconformance jeopardizes analytical results, and reports the nonconformance to the Technical Program Manager
    - Upon assignment, oversees laboratory functions in the absence of the Technical Program Manager

- **Quality Assurance Supervisor**
  - **Responsibilities**
    - Takes administrative direction from the QA Manager.
    - Administers PE and PT program for in-house and EPA proficiencies to demonstrate the quality of daily performance.
    - Maintains records and archives of all DOC records, PE results, internal audit reports, and customer inquiries concerning data quality.
    - Assists QA Manager with SQL-LIMS operations, and daily logging of samples.
    - Prepares annual reports for weight and thermometer calibrations.
    - Assists QA Manager with internal audits.

- Completes annual reviews of MDL's for analytical processes.

➢ **Authorities**

- Directs activities of subordinate laboratory quality assurance staff

- **Laboratory Operations Manager**

➢ **Responsibilities**

- Takes administrative direction from Technical Program Manager.
- Responsible for the technical operations and the provision of the resources needed to ensure the required quality of laboratory operations.
- Implements laboratory QA system, and lends expertise towards its development and annual review.
- Obtains documented training and/or experience in QA/QC procedures and maintains knowledge about the quality management system and about analytical test methods.
- Develops, maintains, and implements accurate SOP's and enforces their use in the lab
- Administers written examinations as part of the Demonstration of Capability process
- Reviews proficiency evaluation and proficiency testing data, and initiates corrective action response in the event of out of specification results.
- Oversees the purchase of laboratory material, standards, reagents, and instrument supplies for lab operations to ensure the quality of analytical results.
- Serves as Deputy Chemical Hygiene Officer (DCHO).

➢ **Authorities**

- Directs activities of and conducts performance reviews for subordinate laboratory operations personnel
- Issues stop work orders if any nonconformance jeopardizes analytical results, and reports the nonconformance to the Technical Program Manager
- Enforces compliance with SOPs and QAM in laboratory operations
- Approves suspect samples and submissions in SQL-LIMS
- Conducts internal audits of laboratory quality system and sample receiving SOP
- Upon assignment, oversees laboratory functions in the absence of the Technical Program Manager

- **Laboratory Operations Supervisor**

➢ **Responsibilities**

- Takes administrative direction from the Laboratory Manager.
- Plans, directs, manages and oversees the activities of laboratory Analytical personnel
- Implements established QA polices, ensuring that the laboratory remains in compliance with these policies.
- Assists Laboratory Manager with writing SOP's, and annual review of SOP's.
- Ensures data validation, and rejection of data for which QC criteria are not met.
- Provides SOP review training classes for Demonstration of Capability process

- Reviews analytical and statistical results from various lab tests; reviews reports for completeness and accuracy.
- Works with employees to correct deficiencies; implement corrective actions.
- Ensures that analyses are properly performed.

➢ **Authorities**

- Directs activities of subordinate analytical staff.
- Approves suspect results in SQL-LIMS
- Upon assignment, oversees laboratory operations functions in the absence of the Laboratory Operations Manager

- **Laboratory Analyst**

➢ **Responsibilities**

- Maintains current Demonstrations of Capability in all Standard Operating Procedures (SOPs) performed
- Performs physical, chemical and biological analyses in accordance with SOPs, and enter analytical results into the SQL*LIMS system
- Enters quality control results into control charts for each test performed, and review control chart for trends
- Conducts peer reviews of other analysts' results and data entry, including review of control chart trends
- Tracks laboratory reagents and supplies, and notifies supervision when replacements are needed
- Assists supervision with troubleshoot instruments and procedures

➢ **Authorities**

- Notifies responsible analyst and/or supervision when quality control deviations are found during peer review
- Notifies supervision of any observed deviations from SOPs or quality assurance requirements

- **Laboratory Assistant**

➢ **Responsibilties**

- Maintains current Demonstration of Capability in WQL QA SOP 101 (Sample Receiving)
- Accepts client samples and logs them into the SQL*LIMS system, in accordance with procedures described in WQL QA SOP 101
- Monitors, tests and maintains records of laboratory support equipment, including but not limited to, sample storage refrigerators and emergency equipment
- Assists with laboratory record-keeping, under the direction of Quality Assurance supervision

➢ **Authorities**

- Notifies supervision of any observed deviations from SOPs or quality assurance requirements

4.1.10 Adequate Supervision of Testing Staff

WQL management will make certain adequate supervision is available of all laboratory staff. It is the responsibility of the Laboratory Supervisors to assign analysts duties and

review test results. Senior analysts, familiar with methods and procedures may be assigned to train analysts learning new processes. Laboratory personnel assigned the duties of training must have a current Demonstration of Capability (DOC) for the procedures being trained. For complete description of training program, see WQL QA SOP-004.

4.1.11 Certification of Personnel
The Technical Program Manager shall certify that personnel with appropriate educational and/or technical background perform all tests for which the laboratory is accredited. The signature and approval of the Technical Program Manager will be required for all initial DOC certifications. It is the responsibility of the QA Manager to ensure completeness of DOC certifications and maintain all records. For complete description of training program, see WQL QA SOP-004.

4.1.12 Training Programs
In addition to the DOC program, WQL mandates a weekly training meeting, which alternates with one week safety training and one week dedicated to quality management training. A schedule of training topics will be announced and posted the beginning of January. The purpose of weekly meetings is for management to train personnel on the relevance and importance of laboratory activities, including how the staff contributes to the achievements of the objectives of the quality system. Additionally, weekly meetings provide the opportunity to maintain communication between staff and management in consideration to effectiveness of the quality system.

4.2 Management System
4.2.1 Quality Assurance Manual (QAM)
The Quality Assurance Manual is the principal document that defines the quality system at WQL. It is maintained current under the responsibility of the QA Manager.

The objective of the Quality Assurance Manual is to provide a required reference for policies and procedures necessary for the operation of WQL. This manual and the referenced policies serve as guide to implementing quality activities for WQL. The overall objectives of the QAM are reviewed during the annual management reviews.

A current copy of the QAM is available to all WQL personnel in the lab J-share drive and several copies will be distributed through out the facility. The controlled "Official Document" is filed in the QA file room. In addition, QA training classes will be provided on an annual basis to communicate changes and to make certain that all appropriate personnel understand the QAM.

4.2.2 Quality Policy Statement
It is the Albuquerque Bernalillo County Water Utility Authority Water Quality Laboratory (WQL) Management's commitment to provide professional and quality service to all our clients. WQL is committed to perform this service in the most accurate, unbiased, and timely manner appropriate to protect the public and the environment.

The primary objective of WQL quality assurance program is to produce quality data at a known precision and accuracy. The data, in turn, must be relied on to represent the true value for a given sample. All WQL personnel will accurately follow our quality

assurance program. It is important that the laboratory management enforce the quality assurance program and procedural polices to ensure quality testing. Additionally, WQL mandates a Demonstration of Capability Program to ensure the analyst proficiency determination and certification with regard to the analyst' knowledge of quality polices and procedures in their work.

WQL maintains accreditation through the American Association for Laboratory Accreditation (A2LA). The accreditation criteria used by A2LA are established in the International Standards Organization Standard 17025 (ISO 17025). WQL quality management system is implemented to comply with ISO/IEC 17025. Furthermore, WQL Management and Staff are fully committed to ensure that all activities are conducted in strict accordance with laboratory procedures and compliance requirements of the ISO/IEC 17025 Standard.

4.2.3 Commitment to the Quality System

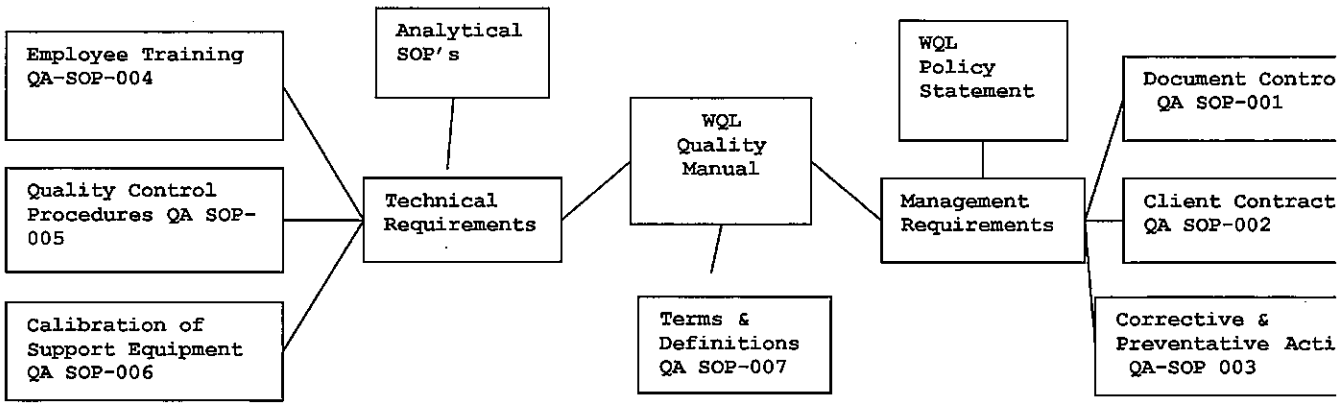
WQL is committed to continual improvement of the effectiveness of the quality system. Annual management reviews will facilitate this goal (Management Review section 4.14). Furthermore, it is the responsibility of WQL management to ensure that the integrity of the quality system be maintained, and if changes need to be made the process will be planned and implemented in a manner that is communicated to both client and laboratory personnel. It is the responsibility of the Technical Program Manager to notify clients, while it is the responsibility of the QA Manager to train laboratory personnel of any changes in the quality system.

4.2.4 Communication to WQL Personnel

It is the responsibility of laboratory management to communicate to WQL personnel the importance of meeting client and regulatory requirements. This will be accomplished with weekly staff meetings and quality assurance meeting when necessary.

4.2.5 QAM Structure

Following is an outline of the structure of the documentation used in the quality management
system.



4.3 Document Control

Document control policies and procedures used by WQL are to ensure that documents and their revisions are proposed, reviewed, approved for release, inventoried, distributed, archived, stored, and retrieved in accordance with the standard operating specifications.

The policy for document control is any written or printed-paper that bears the original, official, or legal form of something and provides rules, guidelines or instructions for activities or their results. Procedures for establishment, maintenance, and changes to controlled documents are outlined in WQL QA SOP-001.

QA SOP-001 also outlines the requirements for control of records. Records are defined as an account, as of information or facts, set down in writing as a means of preserving knowledge or data

4.4 Review of Requests, Tenders, and Contracts

The client agreement process is important to the laboratory because it defines testing and reporting criteria for the laboratory. This process establishes data quality objectives for testing programs. It is the laboratory's goal to satisfy the needs of clients, and carefully review testing programs prior to production of analytical results. The laboratory has established and maintains procedures for review of client contracts, these procedures are defined in WQL QA SOP-002.

4.5 Subcontracting of Tests and/or Calibrations

4.5.1 Subcontract Work

Use of subcontract laboratories for testing by WQL requires that either the laboratory is A2LA accredited for the testing provided or that proof of an equal accreditation is provided. The use of such a laboratory requires on site visitation and evaluation/audit by WQL QA Manager to assure compliance with ISO/IEC 17025 unless the contract laboratory is accredited by A2LA for the applicable testing. This policy pertains to any testing provided for WQL or paid for by WQL. In the case that a subcontract laboratory is not accredited, written approval is required from the client before proceeding with work.

4.5.2 Client Notification

WQL will notify the client in writing when a subcontract laboratory is necessary for work. Client protocols are covered in WQL QA SOP-002.

4.5.3 WQL Responsibility

WQL is responsible for all subcontractors work, including shipping, logging, data entry, and accounts payable. In the case where a client chooses to seek its own subcontract, WQL is not responsible for transporting samples, work performance of subcontractor, nor quality of reported results.

4.5.4 Register of Subcontractors

WQL maintains a register of subcontractors, including, when appropriate, evidence of compliance with ISO 17025 for work performed. Records will also include Albuquerque Bernalillo County Water Utility Authority purchasing contract with the subcontractors. QA personnel maintain these records, which are filed in the QA file room.

4.6 Purchasing Service and Supplies

4.6.1 Policy

The purchasing of services and supplies must follow the Albuquerque Bernalillo County Water Utility Authority purchasing policies provided by the Department of Finance and Management. Vendors are qualified through the Authority bidding processes. The policy will be carried out by using the Water Reclamation Division (WRD) warehouse system, which operates under the provisions of the *City of Albuquerque Purchasing Ordinance.* The ordinance is available through the Authority intranet site and outlines the procedures for purchase and receipt of consumable. WRD has no written procedures for use of the division warehouse.

It is the responsibility of laboratory management to evaluate suppliers of critical consumable, supplies and services, which affect the quality of testing. A complete record of approved vendors and existing contracts is available with the QA Group. If in the event, a supplier is suspected of not conforming to the requirements of this manual a Vendor Noncompliance Form must be submitted to the Fiscal Officer and/or Warehouse Manager. A copy of this form will also be submitted to the QA Manager for filing. The disciplinary actions will follow the City of Albuquerque Purchase Violation Regulations.

4.6.2 Procedure for Purchase and Receiving of Reagents and Consumables

The Laboratory Manager and/or Laboratory Supervisors purchase standards, reagents, or other consumables from the warehouse by issuing a computer-generated warehouse requisition for supplies. It is necessary that they ensure that the items ordered comply with requirements of the test method. Purchasing documents are stored with WRD Inventory Control System.

Supplies are picked up at the warehouse when received from vendor and logged in the *Stock Standards and Reagents Logbook.* Each item is assigned a unique reference number, which is recorded in the logbook, the container, and the Certificate of Analysis (CofA). No standards will be accepted without a CofA. The CofA will serve as the purchasing document containing data describing the supplies ordered. These documents are time stamped, reviewed and approved for technical content prior to release by the Laboratory Supervisors. The CofA must have the signature of the supervisor approving the supplies. All CofA's are filed with QA by month and sequential reference number.

The Stock Standards and Reagents Logbooks are maintained by the Laboratory Manager. This logbook will serve as a compliance record for all standards and reagents received. Standards and reagents that do not meet the requirements for testing will be rejected and sent back to WRD Warehouse. Rejected items will be documented in this logbook and the reason for rejection will be noted.

Other information entered in the logbook include vendor, received date, expiration date, analyte and concentration, product number or lot number, quantity, disposal date, data base entry, receipt of CofA, and receipt of MSDS.

4.6.3 Verification of Reagents and Consumables

It is the responsibility of the Laboratory Supervisors to ensure that purchased supplies, reagents and consumable materials that affect the quality of tests are not used until they

have been inspected or otherwise verified as complying with standard specifications or requirements defined in the methods for the tests concerned. Verification is validated with the signature of the supervisor on the Certificate of Analysis.

4.6.4 Storage of Supplies
Once the supplies are logged and all information is recorded, the materials will be stored in the appropriate areas. Chemical management, distribution, storage and inventory procedures will be followed as outlined in the Chemical Hygiene Plan, Section 5.7.

4.6.5 Procedure for Services
For service to support equipment, which includes certification of weights, balances, certification of NIST thermometer and calibration of hoods, the vendors shall comply with A2LA requirements. This would involve using A2LA or ISO 17025 certified companies. See QA SOP-006 for complete details of requirements.

4.7 Service to the Client
4.7.1 Cooperation with Clients
It is the goal of WQL staff to make every effort to cooperate with the clients in clarifying requests and in monitoring the laboratory's performance in relation to the work performed. Through effective communication, we strive to ensure that our clients are completely satisfied with our services. All inquiries follow the Client Inquiry procedures outlined in section 4.8.

4.7.2 Client Confidentiality
WQL management staff is committed to meeting the needs of clients' confidentiality whenever possible. Client confidentiality is maintained through blind logging of samples with customer identification codes to prevent lab staff from directly knowing any individual sample's identity. No results are released to any third party without the written authorization of the data owner.

4.7.3 Client Feedback
WQL encourages feedback from clients. Client Inquiry records are evaluated during management reviews to look for ways to improve the quality system and customer service. In addition, WQL Management shall conduct an annual customer feedback survey. This survey will be administered to all clients either as a hand written copy or as an electronic version. The results of the survey will be evaluated during the WQL management reviews outlined in section 4.14.

4.8 Complaints
Complaint procedures cover the entire spectrum of questions, inquiries and complaints received from clients. Clients are encouraged to detail inquiries in writing; however, phone calls are accepted as means to open a Client Inquiry. At the time of the inquiry, the inquiry recipient initiates a Client Inquiry Record for documentation; each record is assigned a unique log number that identifies the specific inquiry. The inquiry form is directed to the appropriate laboratory manager for investigation and resolution. It is the responsibility of the Technical Program Manager to inform the client of any findings and ensure satisfaction with resolution. A master list of all complaints is maintained in the Wastewater I-drive. A complete list of complaints for a given year is listed in the annual QA Management Review.

4.9 Control of Nonconforming Testing

WQL has established and maintains a policy and procedure that is implemented when any aspect of its testing, or the result of this work, do not conform to its own procedures or the agreed requirements of the client. The process for nonconforming testing is further defined in WQL QA SOP-003.

4.10 Improvement

WQL is committed to continue to improve the effectiveness of our management system. Annual management reviews, internal audits, control charting data, corrective and preventive actions give us the opportunity to recognize areas that need improvement and implementation of new procedures to meet this commitment.

4.11 Corrective Action

The policy of corrective action is to identify, track, complete the investigation of the problem and correct the causes of existing non-conformances including complaints, processes, the quality management system, and services at WQL. The basis of corrective actions is written and retrievable documentation of actions taken and follow-up monitoring to determine that corrective actions have been implemented. WQL has established procedures for implementing corrective actions when nonconforming work or deviations in the management system have been identified. The process for corrective actions is further defined in WQL QA SOP-003.

4.12 Preventive Action

Preventive actions are a proactive process to identify opportunities for system improvement before failure rather than a reaction to the identification of problems or complaints. WQL has established a policy and procedure for implementing preventive actions when nonconforming work or deviations in the management system have been identified. The process for preventive actions is further defined in QA SOP-003.

4.13 Control of Records

4.13.1 Policy

WQL will implement and maintain a record system that is suitable to operations of the laboratory and applicable regulations as required. The system must produce unequivocal, accurate records, which document all laboratory activities. The records maintained must include all procedures to which a sample is subjected while in the possession of WQL. These procedures are summarized in QA SOP-001.

4.13.2 Identification of Records

WQL records are identified as quality or technical records. The QA Group maintains all quality records, while the Laboratory Group maintains the technical records. A complete master list of both quality and technical records are available in the QA file room. See QA SOP-001 for a complete list of records.

4.13.3 Storage of Records

The QA file room contains current quality control documents. The Archive room contains archived quality and technical records. Out of service documents are retained in the QA file room for a two year period and then are stored in boxes and transferred to the Archive area. Technical logbooks are stored in a bookshelf in the Archive room for a

minimum of two years. After this period, the logbooks are stored in boxes and filed by year. Records are readily retrievable and both of these storage areas provide a suitable environment to prevent damage or deterioration and to prevent loss of records. Records are retained for a minimum of ten years.

4.13.4 Security of Records

Both the QA and Archive file rooms are locked at all times, and only authorized personnel {WQL Management) are allowed access to files. Checked out files need to be dated and signed out by QA Management only. Files or records may not be removed from the facility, but may be copied on-site when required with the approval of the Technical Program Manager and the Quality Assurance Manager. All records shall be held secure and in confidence at all time.

4.13.5 Back-up Records

Laboratory Information Management System (LIMS) is WQL's computer software that is used in the laboratory for the management of samples. The SQL-LIMS back-up records are the responsibility of the IT Division. Archive logs are backed up every 3 hours, incremental backups run at 9 PM every night, every Friday night at 10 PM a full backup is run. Additionally a full database export is taken at 11 PM every Friday. Incremental tape backups (of the backups) are run at midnight every day except on Saturday, when a full tape backup is run. It is also the responsibility of the IT Division to maintain and store these records.

The back-up records for the J and K share drives is the responsibility of QA. The K share drive was set up for access of WQL Managers only, preventing unauthorized access or amendment of QA records. Back-ups of the share drives are performed and recorded on a quarterly basis and are stored in the QA file room. The technical back-up records are the responsibility of the Laboratory Group. The exterior doors to the laboratory wing are locked at all times to prevent unauthorized access. All visitors must follow the guidelines outlined in the CHP-Section 5.2.

4.13.6 QA Records

The QA Section is in charge of all sample receiving functions. There are two levels of sample handling, sample tracking and legal chain of custody. Sample tracking is maintained via LIMS, see Section 5.8.2. Chain of Custody requirements are identified in section 5.8.6. Additionally, Sample Receiving SOP-101 specifies the requirements for sample handling, including management of samples and Chain of Custody procedures (Sections 2.0 & 9.0). For details of personnel records and current staff signature list see QA SOP-001.

4.13.7 Technical Records

WQL will retain technical records of original observations, derived data and sufficient information to establish an audit trail. The records of each test must contain sufficient information to facilitate, if possible, identification of factors affecting the uncertainty and to enable the test to be repeated under conditions as close as possible to the original. For complete detail of requirements, see QA SOP-001.

4.14 Internal Audits

4.14.1 Schedule and Responsibility

The purpose of internal audits is to verify that lab operations continue to comply with the requirements of the quality management system and ISO 17025. WQL internal audits are performed at least once a year, or in the event that a test or procedure is questionable. It is the responsibility of the QA Manager to schedule, plan and organize audits. WQL audits are divided into two sections, Quality System and Laboratory activities. The QA Manager audits the laboratory activities, while the Laboratory Manager audits the quality system. The internal audit program will address all elements of the quality management system, including testing activities.

4.14.2 Audit Procedures

Audit procedures include all WQL personnel and shall be performed by trained and qualified personnel independent of the activity to be audited. For this reason, the QA Manager in conjunction with laboratory analysts will audit each analytical procedure, which includes Chemistry, Nutrients, Demands, Microbiology, and Metals. The Laboratory Manager in conjunction with laboratory assistants audits the Quality System. For minimum review and validation requirement see QA SOP-005 Section 2.1.

4.14.3 Corrective Actions of Internal Audits

Managers and supervisors review all audit findings and implement correction actions as needed. Timely corrective actions will be required when audit findings cast doubt on the effectiveness of the operations or on the correctness or validity of the laboratory's test and/or procedures. The area of activity audited, the audit findings and corrective actions will be recorded and filed in the QA file room. Follow-up audit activities shall verify and record the implementation and effectiveness of the corrective action taken.

4.14.4 Client Notification

In the event audit findings show that the laboratory results may have been affected it is the responsibility of Technical Program Manager to notify customers in writing. The notification must include any event such as the identification of defective measuring or test equipment that casts doubt on the validity of results given in any test report or test certificate or amendment to a report or certificate. The period for notifying a client of events that cast doubt on the validity of results is within thirty days from the time of the audit. It is the responsibility of the QA Manager to ensure that these actions are completed within the agreed period.

4.15 Management Reviews

4.15.1 Responsibility and Schedule

Technical Program Manager, QA Manager and Laboratory Manager will perform WQL management reviews annually following WQL SOP 008. The reviews will be conducted the first quarter of each year and the QA Group will maintain records of review findings and actions. Findings from the management review and the actions will be reported and available to WQL staff and clients.

This review ensures continual suitability and effectiveness of laboratory operations. In addition, it is an opportunity to introduce necessary changes or improvements; including goals, objectives and action plans for upcoming year. WQL QA SOP 008 details the procedures used in the annual Management Review.

4.15.2 Findings of Management Reviews

As described in WQL QA SOP 008, opportunities for improvement and procedural nonconformances identified during the annual Management Review are documented in with Preventive Action Response Reports and Corrective Action Response Reports, respectively. Management of all documentation of investigations and actions follows WQL record-keeping requirements outlined in WQL QAM Section 4.13 and WQL QA SOP 001.

5.0 Technical Requirements

5.1 General

WQL recognizes that many factors determine the correctness and reliability of the tests performed by a laboratory. These factors include contribution from human factors (5.2), accommodation and environmental conditions (5.3), test and calibration methods and validation (5.4), equipment (5.5), measurement traceability (5.6), and handling of test and calibration items (5.8).

The extent to which the factors contribute to the total uncertainty of measurement differs considerably between tests. WQL takes into account these factors in developing test methods and procedures, in the training and qualification of personnel, and in the selection and calibration of the equipment it uses.

5.2 Personnel

5.2.1 Personnel Hiring Policy

All positions in the laboratory fall under the Merit System Ordinance, and are filled on a competitive basis of education and experience, and other qualifications specific to a position and job description. WQL Managers screen applicants prior to interviews to determine those with the best background and experience for the area being interviewed and to assure that applicants meet minimum job requirements. Official job descriptions for all Laboratory positions are maintained on the ABCWUA website. In accordance with Authority hiring and promotion policies, competitive testing for promotional opportunities in the Laboratory is not currently employed.

5.2.2 Documented Qualifications

WRU Human Resource section maintains academic and educational records, including transcripts and diplomas. WQL maintains personnel resumes, training records, demonstration of capability records, and performance evaluation tests for each laboratory test method. It is the responsibility of the QA Manager to maintain all employee records, which are located in the QA file room. This information is readily available.

5.2.3 Supervisory Ratio

The laboratory shall have sufficient personnel with the necessary education, training, technical knowledge, and experience for their assigned functions. Included in this manual is a outline of the organization chart for WQL (see Appendix), specifying in the laboratory section there is one laboratory manager and two lab supervisors in ratio to twelve analyst. For the QA section there is one laboratory manager and one laboratory supervisor in ratio to two-laboratory assistants and one senior office assistant.

5.2.4 Personnel Qualifications

The following represents the goals with respect to the education, training and skills of the laboratory personnel.

- **Laboratory Analysts**
  - Minimum education and experience requirements include the following: Bachelor's degree with major course work in physical or life science, chemistry, microbiology, biology or a related field, plus three (3) years of laboratory analysis experience { *Related education and experience may be interchangeable on a year for year basis}.*
  - Knowledge of pertinent Federal, State and local codes, laws and regulations
  - Knowledge of all Quality Assurance/Quality Control proceedings.
  - Knowledge of occupational hazards and standard safety precautions as related to laboratory testing.
  - Knowledge of principles and applications of mathematics and statistics.
  - Basic laboratory skills such as using a balance, colony counting , pipetting and other quantitative techniques.
  - All laboratory analysts are required to maintain certification of DOC for analytical processes (See QA SOP-004). The lab analysts are responsible to maintain current DOC's for the test methods for which they are accountable. The QA group will document and keep up to date all DOC records.
  - It is not the responsibility of the lab analysts to give opinions and interpretations of results and all client inquires must be directed to lab management.
  - Lab analysts may be required to perform particular types of sampling, such as the collection of TP 2.7 Sample.

- **Laboratory Assistants**
  - High school education is the minimum requirement for this position.
  - Assistants are required to maintain certification of DOC for sample receiving standard operation procedures.
  - May assist lab analysts with analytical process; however, must be limited to only those tasks that do not involve actual analysis. Such would include, glassware cleaning, setting up or tearing down processes, sample tracking, autoclaving and other miscellaneous tasks.

5.2.5 Personnel Responsibility

All WQL personnel are responsible to comply with the requirements of this quality manual and all quality assurance/quality control requirements that pertain to their technical jobs. The QA Manager, for education, communicative, and training purposes, provides a bi-weekly quality assurance training classes.

5.2.6 Personnel Training

In addition to minimum job requirements, WQL maintains a Demonstration of Capability (DOC) program to ensure that laboratory personnel are competent to operate specific equipment, qualified to perform tests, and evaluate results. Evidence is on file that demonstrates that each employee has read, understood, and is using the latest version of the laboratory's SOP, which relates to his/her job responsibilities. A supervisor or a

senior analyst with a current DOC will train staff that are undergoing training. These procedures are defined in WQL QA SOP-004.

Weekly training courses or workshops on specific equipment, analytical techniques, and safety or laboratory procedures are documented in personnel files.

5.3 Accommodation and Environmental Conditions

5.3.1 Environmental Conditions Maintained in the Laboratory

The lab facility must meet environmental conditions that facilitate correct performance of the tests. It is the responsibility of lab management to ensure that the environmental conditions do not invalidate the results or adversely affect the required quality of any measurement. Winter temperature settings are to be 74°F, and summer settings are to be 68°F. Exceptions are the Biotox area, which is to be set at 25°C at all time. Areas where the personnel do not regularly work are to remain off as an energy saving measure. For specific requirements for heating, ventilation, HVAC system, laboratory hoods, and other engineered safety control see Chemical Hygiene Plan section 3.0.

5.3.2 Monitoring and Documenting Environmental Conditions

Laboratory analysts must monitor, control, and record environmental conditions as specified in the test methods and procedures or where environmental conditions influence the quality of the results. Due attention shall be paid, for example, to biological sterility, dust, electromagnetic disturbances, humidity, electrical supply, temperature, and sound and vibration levels, as appropriate to the technical activities concerned.

In the event that the environmental conditions are affecting the results of tests a CARR must be initiated by lab management. Tests must be stopped when the environmental conditions jeopardize the results of the tests and/or calibrations.

The staff is charged with making requests to lab management regarding any repairs or maintenance encountered. Building repairs and maintenance are the responsibility of WRD Plant Maintenance, which require a standard work order before work is initiated. Plant maintenance staff are on call 24 hours per day including weekends and holidays. Laboratory management must evaluate all such problems to determine the level of response required to maintain the laboratory in proper operating procedures.

5.3.3 Controls on Laboratory Section

There are two main sections to the laboratory facility, the office area and the laboratory area. Only WQL personnel are allowed access into the laboratory area without escort. The exterior doors to the laboratory wing are locked at all times. Laboratory authorization for visitors, contractors, and maintenance personnel, is discussed in the CHP section 5.2.

The laboratory section is divided into several sections, including the Biotox, Metals, Chemistry, Microbiology, and Sample Prep areas. The divided sections provide effective separation between neighboring areas in which there are incompatible activities. It is the responsibility of lab management to take all measures to prevent cross-contamination. Additionally, workspaces must be available to ensure an unencumbered work area. Work areas include, access and entryways to the laboratory, storage areas, sample receiving area, sample storage area, sample prep area, and areas mentioned above. Copies of WQL floor plan are posted throughout the laboratory.

5.3.4 Good Housekeeping

Cleanliness and good housekeeping is strongly encouraged at all times. It is the laboratory supervisors' responsibility to implement good housekeeping rules. These rules are documented in analytical SOP's.

5.4 Test and Calibration Methods and Method Validation

5.4.1 Standard Operating Procedures

WQL Standard Operating Procedures are divided into quality assurance and analytical SOP's. QA SOP's are developed to ensure requirements of the quality system and are developed by the QA Manager. QA SOP-005 outlines quality control procedures to ensure that the reported data are free from transcription and calculations errors and that all quality control measures are validated before the data is reported. This SOP also addresses manual calculations and data validation.

WQL performs testing according to analytical Standard Operating Procedures (SOP's) that accurately reflect each accredited analyte or test method. These documents are established to assure consistency and correct procedures in performing testing using equipment, and handling and preparation of items for testing.

All analytical SOP's are developed by the Laboratory Manager or Laboratory Supervisors and must be approved by the Laboratory Manager and by the Technical Program Manager before implementation. The laboratory shall confirm that it can properly operate all methods before introducing the tests. Therefore, prior to acceptance and institution of any method, satisfactory demonstration of method capability is required. This may be accomplished by analysis of a MDL or a PE sample for a specific analyte or test method. The procedures outline in 5.5.2 will be followed for demonstration of capability of all test methods. Thereafter, continuing demonstration of method performance will be monitored through the Water Pollution (WP) and Water Supply (WS) studies performed twice a year. A demonstration of capability must be completed each time there is a change in instrument type, personnel, or method. If the standard method changes or any changes to the procedures are made, the confirmation and approval of the SOP shall be repeated.

Each written SOP will be standardized for each method. The standard format will include the following:

- *SCOPE AND APPLICATION*
- *SUMMARY OF METHOD*
- *DEFINITION OF TERMS*
- *INTERFERENCE, SAFETY*

- *APPARATUS AND EQUIPMENT*
- *REAGENTS AND STANDARD*
- *QUALITY ASSURANCE/ QUALITY CONTROL*
- *PROCEDURE*
- *DATA REPORTING*
- *MAINTENANCE*
- *TROUBLESHOOTING*
- *WASTE DISPOSAL AND POLLUTION PREVENTION*
- *REFERENCES*
- *LOGBOOK CONTROL DOCUMENT*

Each SOP shall also clearly indicate the effective date of the document, the revision number and the initials of the approving authority. The SOP's are numbered and organized according to the sections within the lab. For example, Chemistry SOP's are numbered is the 200 series, Microbiology in the 300 series, Biotox in the 400 series, and Metals in the 500 series. A master list of all WQL SOP's nomenclature and numbering is available in the QA file room.

It is the responsibility of the Laboratory Manager to annually review all analytical SOP's and to ensure that they are kept up to date. Deviations to the analytical SOP's must be documented, technically justified, authorized by management, and accepted by the client.

WQL policy is that analyst's follow written SOP's at all times in performing tests. An official (controlled) copy of each SOP is maintained in the QA file room, and copies of each SOP can be provided from the Laboratory Manager office, or from the lab-share drive.

5.4.2 Test Methods

Analytical SOP's are referenced to one or more refereed analytical procedure references such as Standard Methods or EPA procedures. WQL will use the latest approved edition of Standard Methods or EPA Methods. A copy of the method applied for each accredited analyte or test method will be on file with the official SOP in the QA file room.

WQL must use test methods that meet the needs of the client. Per protocol agreement, WQL will notify the client as to the methods chosen to run their tests. When the customer does not specify the method to be used, the laboratory shall select appropriate methods that best meet the client needs.
Additionally, it is the laboratory's responsibility to notify the client when the method proposed by the client is out of date or inappropriate or does not meet the requirements.

5.4.3 Approval of Non-Standard Test Methods

Use of non-standard, or unapproved, procedures can result in unsafe working conditions, compromise data integrity, and may lead to potential fines and criminal penalties. Non-standard procedures are not approved for use by WQL management and must not be performed without direct approval of the Technical Program Manager and the Quality Assurance Manager. In the event of exceptional circumstance that may result in the need

to deviate from established procedures, the Technical Program Manager will issue a written plan prior to proceeding with the non-standard activity. Therefore, deviation from test methods shall occur only if the deviation has been documented, technically justified, authorized, and accepted by the client.

5.4.4 Estimation of Uncertainty of Measurement
Procedures for estimation of uncertainty of measurement at WQL are defined in QA SOP-005 and QA SOP-006. SOP 005 addresses complete procedures for estimating uncertainty of test methods through the control chart review process. Control chart reviews give lab personnel the opportunity to identify components of uncertainty and bias data, while making a reasonable estimation of uncertainty and ensuring that reported results are giving a reasonable impression of accuracy. Reasonable estimation is based on knowledge of the performance of the method and on the measurement scope and makes use of previous experience and validation data.

Although WQL is only a testing laboratory and does not perform calibration certifications, QA SOP 006 addresses the uncertainty measurement of calibration of support equipment used within the laboratory. This includes the use of thermometers and weights of measurements. A NIST-certified thermometer is used to calibrate all thermometers used in the laboratory on an annual basis. The NIST thermometer will be recalibrated every two years by a calibration laboratory certified by NIST, or accredited by A2LA for thermometer calibrations. Working thermometers calibrated at WQL will be traceable to the NIST thermometer according to SOP QA-006.

A set of Class A weights used by QA for checking Class B weight utilized in the laboratory will be sent for recalibration to a laboratory certified by NIST or accredited by A2LA every 5 years. The Class B weights are certified annually according to procedure defined in QA SOP 006.

5.4.5 Control of Data
WQL employs a laboratory software system, SQL-LIMS, for sample logging, result entry, storage and retrieval of data. This system is a product of Applied Biosystems, Inc. It is the responsibility of the Information Technology Division (ITD) to maintain the system, ensuring data storage and transmission. ITD personnel are also the system administrators who maintain the hardward and software environment conditions to protect the integrity of records. Access to the LIMS system is by user name password account and is managed by the SQL-LIMS Manager, as defined in section 4.1.9.
The LIMS system is located in the WRD computer building, which is controlled through access of card keys issued only to authorized personnel. All changes to results must have the written approval of the Technical Program Manager and the QA Manager. Clients will also be notified via the Client Inquiry procedures. See Section 4.13.5 for complete details of back up procedures.

Daily validation of 5% of complete and approved data, all suspect not approved data, and client automated checking is performed and documented daily. Any corrections performed as a result of these audits are verified and documented. All files are stored in the QA file room.

5.5 Equipment

5.5.1 Availability of Equipment and Supplies
The laboratory will be supplied with all items of measurement and test equipment required for the correct performance of the tests. It is the responsibility of the Authority to make available the necessary budget for equipment and supplies for laboratory operations. All supplies procured by the laboratory are acquired through the Water Reclamation Division Warehouse and purchasing system. Supplies are ordered by issuing a computer generated warehouse requisition; the warehouse is accountable for ordering all supplies.

5.5.2 Purchase of Equipment
Equipment and its software used for testing must be capable of achieving the accuracy required and must comply with specifications relevant to the tests concerned. It is the responsibility of WQL Laboratory Managers to ensure that purchased equipment is capable of achieving the accuracy required and complies with specifications relevant to the tests performed and that supplies are of sufficient quality for the application. This process is accomplished through the Authority purchasing procedures.

5.5.3 Support Equipment
Support Equipment would include balances, ovens, refrigerators, freezers, incubators, autoclaves, water baths, temperature measuring devices, and volumetric dispensing devices.

All support equipment will be calibrated or verified at least annually, using traceable references when available, over the entire range of use. The results of such calibration shall be within the specifications required of the application for which this equipment is used; or the equipment shall be removed from service until repaired; or the laboratory shall maintain records of established correction factors to correct all measurements.

Prior to use on each working day, balances, ovens, refrigerators, freezers, and water baths are checked in the expected use range. Refrigerators for sample storage are check twice daily. All mechanical volumetric dispensing devices are checked quarterly. For chemical tests the temperature, cycle time, and pressure of each run of autoclaves must be documented. The acceptability for use or continued use of all support equipment shall be according to the needs of the analysis or application for which the equipment is being used.

It is standard procedure for measuring equipment to be assigned to designated areas, without moving them from one area to another, to prevent cross contamination and to prevent damage to equipment. Pipets and dispensers are assigned to location of operations, and it is recommended that pipets not be interchanged between sections. For complete inventory, see Equipment and Pipet/Dispenser Inventory Log Form. All maintenance records are on file in the QA file room.

All support equipment will be maintained in proper working order. In the event that equipment needs repair or maintenance, lab management will record the equipment out of service with the QA group. Equipment out of service will be tagged and the reason for out of service will be documented. It will remain out of service until the repairs are complete and the equipment has been tested. All records of repair and maintenance activities will be filed with QA. If the equipment is used, that was not working properly,

and results were reported, a CARR must be initiated. A master list of all support equipment is available in the QA file room.

5.5.4 Installation & Calibration of Equipment

Before being placed into service, equipment will be calibrated or checked to establish that it meets the laboratory's specification requirements and complies with the approved method. The following conditions must be met:

1. Calibration criteria must be accepted for quantities or values of the instruments (IDL) where these properties have a significant effect on the results.
2. Details of the initial instrument calibration procedures including calculations, integrations, acceptance criteria and associated statistics must be included in the SOP.
3. Sufficient raw data records must be retained to permit reconstruction of the initial instrument calibration; concentration and response, calibration curve or coefficient used to reduce instrument responses to concentration.
4. Sample results must be quantified from the initial instrument calibration and may not be quantified from any continuing instrument calibration verification unless otherwise required by regulation or method.
5. All initial instrument calibrations must be verified with a standard obtained from a second manufacturer.
6. Criteria for the acceptance of an initial instrument calibration must be established. The criteria used must be appropriate to the calibration technique employed.
7. The lowest calibration standard shall be the lowest concentration for which quantitative data are to be reported. Any data reported below the lower limit of quantitation should be considered to have an increased quantitative uncertainty and shall be reported using defined qualifiers or flags or explained in the case narrative.
8. The highest calibration standard shall be the highest concentration for which quantitative data are to be reported. Any data reported above this highest standard should be considered to have an increased quantitative uncertainty and shall be reported using defined qualifiers or flags or explained in the case narrative.
9. Measured concentrations outside the working range shall be reported as having less certainty and shall be reported using defined qualifiers or flags or explained in the case narrative. The lowest calibration standard must be above the limit of detection.
10. If the initial instrument calibration results are outside established acceptance criteria, corrective actions must be performed and all associated samples reanalyzed. If reanalysis of the samples is not possible, data associated with an unacceptable initial instrument calibration shall not be reported with appropriate data qualifiers.
11. If a standard method does not specify the number of calibration standards, the minimum number is two, not including blanks or a zero. The SOP's will include procedures for determining the number of points for establishing the initial instrument calibration.

Following is the outline of the procedures that must be implemented prior to use for all equipment.

Step	Procedure	Person
1	Install	Vendor Technician
2	Vendor training/In house training	Vendor Technician/ Lab Supervisor
3.	Instrument Method Development *computer set-up *initial calibration *set up procedures definition *operating condition/reagents *MDL (initial)	Lab Supervisor/Lab Manager
4.	SOP Preparation	Lab Supervisor/Lab Manager
5.	SOP Approval	QA Manager
6.	DOC (Analysts) *Analyst Training *Analyst practice	Lab Supervisor/Lab Manager
7.	DOC Reviews & Exams & PE	QA Manager
8.	Final MDL	Lab Supervisor/Lab Analyst
9.	SQL-LIMS Development	QA Manager

5.5.5 Loaner Equipment

In the event, that WQL uses equipment outside its permanent control, such as loaner equipment, section 5.5.2 of this manual must be observed. This will ensure that all the requirements of ISO 17025 are met.

5.5.6 Out-of-Service Equipment

Any equipment that fails to perform properly or that leads an analyst to suspect results must be immediately reported to the Laboratory Supervisor. If the equipment is determined to be malfunctioning or subjected to overloading or mishandling the equipment will be taken out of service. The quality system requires that the instrument be tagged "Out-of-Service", and logged in the Out of Service Log with QA. Until the equipment is repaired or evaluated by maintenance contractors the equipment is to remain in this condition. Before the instrument is put back in service, a calibration curve must be evaluated with confirmation from a second source standard.

5.5.7 Operation of Equipment

Test and calibration equipment, including both hardware and software, must be safeguarded from adjustments, which would invalidate the test results. For this reason, only WQL personnel are authorized to operate lab equipment. For equipment with defined SOP's, only an analyst with completed DOC's will be allowed to operate equipment without supervision. See WQL QA SOP 004 for training requirements. Current SOP's will serve as up-to-date instructions on the use and maintenance of equipment.

Calibrations and intermediate checks are necessary to maintain confidence in the calibration status of the equipment; procedures defined per analytical SOP. Laboratory analysts are responsible for verifying and documenting calibration of each measurement system they use, including measuring equipment. Furthermore, all correction factors, for example temperature correction factors, that affect calibrations must be recorded in

respective logbooks. Laboratory supervisors are responsible for confirming that laboratory analysts have performed required calibration confirmations. In addition, it is the responsibility of the analysts to report to the laboratory supervisor when calibration confirmation cannot be achieved for any instrument. Corrective Actions are documented in the appropriate analytical logbooks, which must be signed by the Laboratory Supervisors. All records of calibrations and intermediate checks are recorded in analytical records or logbooks. See QA-SOP 005-Quality Control Procedures for complete procedures of daily initial instrument calibration checks and continuing instrument calibration verifications for each analytical batch.

5.5.8 Maintenance

Analytical SOP's define the use and maintenance of equipment. These SOP's outline the necessary maintenance required to ensure proper function. All calibration data is documented where it can be readily associated with the analytical results and be available for reporting to the client as may be requested. Laboratory work sheets, bench sheets, and logbooks have prepared spaces for all measurements necessary to meet this requirement. Records of unsuccessful calibrations must also be recorded to document problems with instrumentation and to support the need for additional training and/or new equipment. It is the responsibility of the Laboratory Supervisor to ensure that maintenance entries are recorded in the appropriate logbook.

5.5.9 Record-keeping of Equipment

Before new equipment is put into service, it must be logged into the Instrument or Equipment Inventory Log form. A WQL Instrument Log and Inventory sheet is recorded for each item of equipment and filed with the appropriate file. The following is a list of items recorded in this log:

- Instrument Identification and/or Software
- Manufacture/Vendor
- Serial # & Model #
- Condition at time of purchase
- Date of Purchase - Date Received - Date in Service
- Lab Service Location and Location of Manuals
- Service Contracts

Equipment records are maintained by the QA Manager and are available in the QA file room. A full inventory of instrumentation and support equipment is also available. In addition, all maintenance records and repair reports from contractors are filed in the QA file room.

Results and copies of reports and calibration records are all filed with the technical records. Additionally, all maintenance plan, maintenance carried out to date, and instrument repair logs are also kept with the technical records. It is the responsibility of the Laboratory Supervisors to maintain these records.

5.6 Measurement Traceability

5.6.1 General

All WQL equipment having an effect on the accuracy of the results of the test shall be calibrated before being put into service. Calibration requirements are divided into two

parts: 1) requirements for analytical support equipment, and 2) requirements for instrument calibration. The requirement for instrument calibration is divided into initial instrument calibration and continuing instrument calibration verification. These procedures are outlined in QA SOP-005

5.6.2 Support Equipment Calibration
QA SOP 006 outlines WQL procedures for calibration of support equipment. All equipment must follow the guidelines in section 5.5.4 of this manual. This includes balances, weights, thermometers, pipettes and dispensers.

5.6.3 Calibration & Testing Requirements
WQL employs measuring and test equipment utilizing the International System of Units (SI) ensuring that calibrations and measurements made by the laboratory are traceable to SI units. In the event that certain calibrations cannot be made in SI units, WQL will acquire confidence in measurements by establishing traceability to appropriate measurement standards either. This may be accomplished by the use of certified reference materials provided by a vendor, by the use of specified method standards that are clearly described and agreed by all clients concerned, or by establishing that equipment used contributes little to the total uncertainty of the test result.

5.6.4 Performance Evaluation Studies
WQL participates in a number of proficiency evaluation programs. Among them are the following:

- EPA/ERA Water Supply Study
- EPA/ERA Water Pollution Study
- EPA/ERA DMR Study
- ERA Microbiology check samples as part of Water Supply Studies
- USGS Study

WQL maintains a contract with an A2LA-accredited provider for proficiency evaluation samples. The Quality Manager reports to the submitting agency all results of EPA performance evaluation samples in an accurate and acceptable manner after receiving analytical results from the pertinent Laboratory Manager. Corrective action responses to deficiencies ("not acceptable") results are returned to the Laboratory Quality Manager within 30 days of receipt of the assessment of a performance evaluation sample. Copies of proficiency sample results and corrective actions are maintained in the QA file room.

5.6.5 Reference Standards and Materials
All inorganic and organic standards utilized for instrumentation/methodological calibration and preparation of quality control check samples shall be NIST traceable. WQL does not have procedures for calibration of reference standards; therefore, all standards will be commercial purchased. Primary standards must be obtained from a reliable, certifiable source and be of the highest possible purity. Standards from approved commercial vendors must be accompanied with certificates of analysis, establishing traceability to NIST or other national standard of measurement. It is the responsibility of the Lab Supervisors to make certain all certificates are stamped with date and time received, and turn in to QA. All certificates of analysis will be filed with QA.

All reference standards purchased are to be used for calibration only and for no other purpose, unless it can be shown that their performance as reference standards would not be invalidated. Reference standards must be calibrated before and after any adjustments to instrumentation. For specific criteria refer to QA SOP-005.

Reference materials, were possible, must be traceable to SI units of measurement, or to certified reference materials. Internal reference materials must be checked as far as is technically and economically practicable.

5.6.6 Intermediated Checks
Check needed to maintain confidence in the calibration status of reference, primary, or working standards and reference materials are outlined in QA SOP-005.

5.6.7 Transport and Storage
WRD Warehouse is responsible for maintaining all documents for purchase and receipt of supplies. All reagents, chemicals, and standards are transported from the warehouse in original packages, logged in the Standard Logbook, and assigned a unique identification number. This number is written in the logbook and on the bottle for quick reference. It is the responsibility of Laboratory Supervisor to record all incoming standards and it is the responsibility of QA to file certificate of analysis. Standards are stored in appropriate work areas.

The laboratory records for all standards, reagents, reference materials and media must include the following:

- manufacturer/vendor, the manufacturer's Certificate of Analysis or purity (if supplied)
- date of receipt
- recommended storage conditions
- expiration date after which the material shall not be used
- Original containers will be labeled with an expiration date.
- Records will be recorded on reagent and standard preparation in appropriate logbooks. These records shall indicate traceability to purchased stocks, reference to the method of preparation, date of preparation, expiration date and preparer's initials.
- All containers of prepared standards, and reference materials must bear a unique identifier and expiration date and be linked to the documentation requirements listed above.
- Procedures must ensure prepared reagents meet the requirements of the test method, which will be documented in appropriate analytical SOP's.
- All containers of prepared reagents must bear a preparation date. An expiration date shall be defined on the container or documented elsewhere as indicated in the laboratory's quality manual or SOP.

5.7 Sampling
5.7.1 Sample Collection Requirements
WQL is a client based receiving laboratory; clients are responsible for all sample collections. Samples received must be accompanied with a Chain of Custody, whose purpose is to record relevant data and information relating to sampling. These records

include, but not limited, to identification of sampler and submitter, environmental field conditions, type of sample container, and preservation information. Client sample point identifies the sampling location for sample submitter. Additionally, a comments and documentation area is allowed for diagrams and other information that may identify the location. For a complete explanation of sample receiving requirements see WQL Sample Receiving SOP 101.

5.7.2 Subsampling
When sample aliquots are required, from a submitted sample, laboratory personnel must document procedures and techniques used to obtain representative subsamples in the appropriate logbooks. An example of such subsampling would include daily process control samples.

5.7.3 Deviations to Samples
When clients request deviations, additions or exclusions from documented sampling procedures or from samples submitted a Client Inquiry must be initiated from the client (See Section 4.8 of this manual for client inquiry procedures). The Client Inquiry will serve as a record, will include details of appropriate sampling data, and will include all documents containing test results. It is the responsibility of the Laboratory Manager to communicate all changes to laboratory personnel.

5.8 Handling of Test Items
5.8.1 Policy
While the laboratory does not have control of field sampling activities, it is essential to ensure the validity of the laboratory's data for the transportation, receipt, handling, protection, storage, retention and/or disposal of test items. WQL Sample Receiving SOP 101 addresses these procedures and includes all provisions necessary to protect the integrity of the test, and to protect the interests of the laboratory and the client. The following topics are identified in SOP 101:

- Unique sample identification – Section 2.2
- Sample integrity – Section 2.4
- Chain of custody submittal – Section 2.5
- Sample submitter responsibility – Section 2.8
- Storage and preservation of samples – Section 4.0
- Temperature requirements – Section 6.3 & 9.6
- Sample container requirements – Section 6.5 & 9.4
- Laboratory security – Section 9.1
- Sample receiving requirement – Section 9.2
- Chain of custody requirements – Section 9.5
- Sample preservation – Section 9.7
- Storage of samples – Section 9.8
- Holding time policy – Section 9.9
- Sample Rejection – Section 9.13 [Abnormalities from specified conditions and client communication]
- Sample Disposal – Section 10.0

5.8.2 Identification of Test Items
When samples are logged, the SQL-LIMS software creates database records that

represent the sample or the sample group to which the sample belongs. These sample groups are called Sample Plans. Within each Sample Plan, a group of Methods or Operations is attached to each record, identifying the tasks to be done on the sample. An identification number (ID) is assigned to each record and is used to uniquely identify items to be tested for all samples or tasks including, subsamples, subsequent extracts and/or digestates. The task ID is the laboratory code that links the sample with related laboratory activities or test methods. An ID number is nine digits long and is distinguished by the first digit:

Record Type	**ID Series**
Submission	100000000
Sample	200000000
Task	300000000
Result	400000000

5.8.3 Sample Container Identification
See Section 9.4 of Sample Receiving SOP 101 for specific requirements of sample containers and sample labeling requirements. After samples are logged in LIMS, task labels with ID of sample and each task is placed on the container. This ID includes unequivocal link with the unique field sample points assigned to each container. The labels purchased will be waterproof, durable labels.

In the event that LIMS is inoperable and samples cannot be logged, sample-receiving personnel may pre-assign ID number to sample containers using the field sample point id or may use a unique ID that will represent that sample only such as time and date. This is only a temporary number until samples may be logged. The temporary ID will be identified on the chain of custody at time sample is delivered.

The ID numbers assigned to each sample or tasks are retained throughout the life of the item to be tested. The LIMS system is deigned and operated to ensure that items cannot be confused physically or when refereed to in records or other documents within the laboratory. Samples sent to contract laboratories will also be logged in LIMS and identified with the assigned ID for reporting purposes.

5.8.4 Variation to Samples Received
Upon receipt of samples, abnormalities or variations from normal or specified conditions, as described in the test method, must be texted in LIMS. If necessary, a Client Inquiry will be initiated by laboratory management, notifying the client of the nonconformance. In addition, when there is doubt as to the suitability of an item for test, or when an item does not conform to the description provided, or the test required is not specified in sufficient detail, the laboratory management shall consult the client for further instructions before proceeding.

5.8.5 Rejection of Samples Received
If the samples received do not meet the sample receipt acceptance criteria, as outlined in Sample Receiving SOP 101 Section 9.0, laboratory management must initiate a Client Inquiry. The Client Inquiry will include all records of conversations or emails concerning the final disposition of rejected samples or document any decisions to proceed with analysis of samples not meeting acceptance criteria. The condition of the sample

will be texted in LIMS and noted on the chain of custody. The text in LIMS will serve as the "qualifier" of the results.

5.8.6 Records of Samples Received

A sample-receiving logbook is utilized as a permanent chronological record for all samples received. The information include Submission ID, Sample ID, Sample Range, Sample Type (Sample Plan), Date Submitted, Sample Submitter, and Comments if needed.

Two additional logbooks are maintained by sample receiving for distribution of sample containers. On logbook is dedicated for Bacti containers. Information includes, Date Issued, Client, WQL Log #, and Number of Bottle. The second logbook is for all other sample containers distributed to clients. The information includes, Date Issued, Client, Signature, Description, Size and Number of Bottle issued.

A Sampler Signature List Logbook is records of all clients that submit samples to WQL. Before submitters initials are added to LIMS, he or she must sign this logbook. It is the responsibility of the SQL-LIMS Manager to make certain that initials are added to LIMS.

The Chain of Custody will serve as the permanent sample receipt log, recording the following:

- Client/Sample Plan
- Field Sample Point ID
- Date and time of laboratory receipt
- Unique laboratory ID code
- Signature of submitter
- WQL Lab assistant signature making the entries
- List of containers submitted
- Preservation of samples
- Comments from samplers or lab personnel resulting from sample rejection

The container label will not serve as a permanent record and will only be used to cross-reference with the chain of custody. The container label must be written in waterproof ink and include at minimum the following:

- Identification of laboratory
- Lot number of certificate of analysis
- Collection date, time and location (Field Sample Pt ID)
- Initials of sampler

The LIMS generated label will not serve as a permanent record but will serve as a link of the test methods and the laboratory sample ID. This label will include the following:

- Sample collection date and time
- Submission ID
- Sample ID
- Sample Plan
- Task Method

All sample receiving records, including Chain of Custodies and Logbooks, are readily available and maintained by QA.

5.8.7 Storage of Samples Received
It is the responsibility of all laboratory personnel to protect all samples received from deterioration, loss, or damage to the test items during storage, handling and preparation. Sample storage procedures are outlined in Sample Receiving SOP 101 Section 9.8. These procedures are also mandated for sample fractions, extracts and other sample preparation products or sample shall be stored according to specifications in the test method. Storage of metals samples, other than Hg, would be an example of storing according to specification of method, which requires for these sample to be stored at room temperature. In addition, laboratory security procedures in Section 9.1 of SOP101 must also be implemented to protect all test items.

Sample must be stored away from all standards, reagents, food and other potentially contaminating sources. It is also important for samples to be stored in a manner to prevent cross contamination. For this reason sample storage refrigerators are designated for specific lab sections. It is the responsibility of lab personnel to maintain this order.

Analytical SOP's outline the procedures for disposal of samples, digestates and extracts or sample preparation products.

5.9 Assuring the Quality of Test Items
5.9.1 Quality Assurance Procedures
The formal structure of our quality assurance program is contained in Standard Operating Procedures (SOP's), through which each specific test is detailed. Strict adherence to the correct procedure is required and documented, which is continually monitored and updated as changes or new developments occur. Assurance of quality analytical results will be achieved by applying the techniques to all analytical methods as outlined in WQL QA SOP-005.

5.9.2 Reviewing the Data
Resulting data will be recorded in logbooks associated with each analytical process. For results that are computer generated, reports will be filed in association with protocol and batch of sampling. Recording data per process will allow analysts to detect trends and, where practicable, apply statistical techniques when reviewing data. The use of control charts, as outlined in QA SOP -005 Section 2.2, will also serve to review trends in data.

A validation process is also required for reviewing data; see QA SOP -005 Section 3.2. The validation procedures detail the defined responsibility of laboratory personnel in validation of data. Validation must include, but not limited to, the following:

- Use of certified reference standards
- Secondary reference standards
- Quality Control Requirements – QA SOP-005 Section 4.0
- Batch requirements – QA SOP -005 Section 3.2
- Retesting or recalibration of test items
- Calculations and dilutions
- Signatures and date of analysis [time of analysis if required]

- Corrective action entries
- Maintenance log entries
- Data entry confirmation

5.9.3 Corrective Action of Quality Control Data
The requirements for quality control analysis are summarized in QA SOP-005 Section 4.0. When quality control data is found to be outside pre-defined criteria, corrective actions must be implemented as outlined in Section 4.2 of QA SOP-005 to prevent incorrect results from being reported.

5.10 Reporting the Results
5.10.1 Methods of Reporting Results
It is the goal of WQL to report all results as accurately, clearly, unambiguously and objectively as possible. All laboratory data is entered via the SQLLIMS system, see section 5.4.4 for details on process of data control. The laboratory analysts are responsible for result entries of the data produced each day. Customers have read only access to results using MOCHA; an Access based front-end reporting system, which directly reads the SQLLIMS oracle database tables. Only APPROVED results can be accessed via MOCHA.

Alternative method of reporting is by automated or sample LIMS reports or hard copy data reports. All reports must include all the information requested by the customer and necessary for the interpretation of the test results and all information required by the method used.

In the case that clients require transmission of test results by telephone, fax or email a copy of the report will be filed with QA. The report must include all corresponding emails or attachments to the report sent to the client. This process will ensure that WQL reporting requirements are met and that confidentiality is preserved.

In the event results are reported by phone or email without the use of a report, a Client Inquiry must be initiated. In such a case the requirements list below is not required, however, the client inquiry will serve as record of report.

In Microbiology, clients call to verify test results. A telephone logbook is used to record all inquiries. Information recorded includes, name of client, phone number, date of call, time of call, sample ID, and result reported.

For compliance purposes, the requirements for reporting in section 5.10.2 must be met. This would also include data WQL provides to other divisions within the Authority or clients that are using the information to report to regulatory authorities. Examples of this report would include the following:

- Daily Process Aggregate Data Sheet generated by LIMS daily for WRD Plant Operations
- Discharge Monitoring Report (DMR)
- Town of Bernalillo Monthly Reports

5.10.2 Minimum Report Requirements

The format of reports must be designed to accommodate each type of test carried out and to minimize the possibility of misunderstanding or misuse. Therefore, WQL test reports shall include the following information:

- Title
- Name and address of WQL
- Unique identification of the test report – Request ID, which must be identified on each page
- Page X of Y
- Identification of the client and Sample Plan – Protocol
- Field Parameters
- Sample Point ID
- Date of Sampling
- Sample Type
- Identification of the sampling plan and method used – Operation/Method
- Identification of the item(s) tested – Component
- Task Prep Date, Run Date and Done Date
- Result and units of measurement
- Identification of data calculated on a dry weight or wet weight basis – all units are wet weight unless identified as dry weight in the units section of the report
- The name(s), function(s) and signature(s) or equivalent identification of person(s) authorizing the test report
- Statement to the effect that the results relate only to the items tested
- Statement of report only being official if signed

In addition to the requirements above, WQL reports must provide, where necessary for the interpretation of the test results, include the following:

- Deviations from addition to, or exclusions for the test method and information of the specific test conditions if a nonconformance has occurred
- Statement of compliance/non-compliance occurrences as necessary
- Additional information which may be required by specific methods or clients
- Qualification of results with values outside the working range
- Any standard or other specification for the sampling method or procedure, and deviations, additions to or exclusions from the specification concerned.
- Qualification of numerical results with values outside the working range.

Analysts will text this information in LIMS and information will be included in the Comments area of the report.

5.10.3 Reports Generated by WQL

1. Automatic Unofficial Reports – These reports are set up at clients' request, and are automatically sent to the client by e-mail when a sample or task is complete in SQL-LIMS.

2. SQL-LIMS Official Report (*Client Report*) - As requested by client, this report is generated through SQL-LIMS, and may be faxed, e-mailed, or

mailed to the client.

3. Hard Copy Reports {*Certificate of Analysis*} – As requested by client, this form is a controlled QA document that requires the signature of all WQL Management.

4. Daily Process Reports – SQL-LIMS customized generated report specifically for WRD Operations.

5.10.4 Opinions and Interpretation
WQL is a reporting laboratory, and does not offer opinions or interpretations on data. This task is the responsibility of the clients.

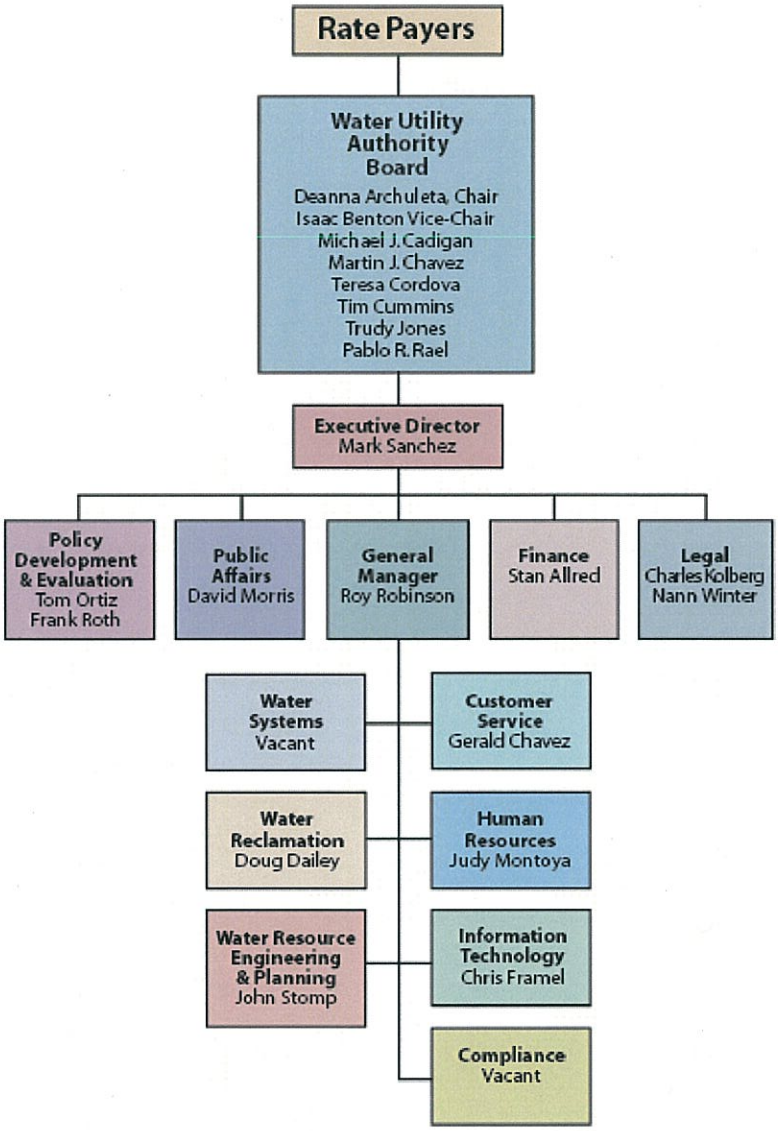
5.10.5 Subcontractors Reports
When the test report contains results of tests performed by subcontractors, it is the responsibility of QA to text the samples in LIMS indicating the subcontractor. In the reports the Comments area will identify the subcontractor. It is also the responsibility of QA to acquire and file all subcontractor reports. Samples are logged via SQL-LIMS before released to subcontractor. Data is entered into the SQL-LIMS system and validated by QA personnel.

In the case when a calibration has been subcontracted, such as NIST thermometers and Class A weights, it is the responsibility of QA to acquire calibration certificates from the contracting laboratory.
Subcontractor reports or certificates are stored in the QA file room.

5.10.6 Amendments to Reports
All amendments to test reports after issue are handled through Client Inquiry procedures outlined in section 4.8. When it is necessary to issue a complete new test report, a new request ID must be issued and must contain a reference to the original that it replaces.

6.0 A2LA Logo
The A2LA logo will be used only when WQL prepares, at client request, a formally endorsed Certificate of Analysis. WQL Certificates of Analysis will be used to report results only for accredited analytes. For non-accredited analytes, a standard SQL-LIMS Client Report will be prepared, if requested by the client, endorsed by WQL management.

Albuquerque Bernalillo County Water Utility Authority Organizational Chart



The Water Utility Department/Water Reclamation Division